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ABSTRACT

This booklet is the eighth of a series of 16 booklets that together describe and present findings for a study which involved field observations and a survey of science teaching and learning in American public schools during the school year 1976-77. The study was undertaken to provide the National Science Foundation with a portrayal of current conditions in K-12 science classrooms to help make the Foundation's programs of support for science education consistent with national needs. Eleven high schools and their feeder schools were selected to provide a diverse and balanced group of case study sites. One field researcher was assigned to each site and instructed to find out what was happening and what was felt important in science (including mathematics and social science) programs. The case study report from the "Western City, California" site is contained in this booklet. (MN)

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Case Studies in Science Education
A project for the National Science Foundation
conducted by CIRCE and CCC
270 Education Building
University of Illinois at Urbana-Champaign

BOOKLET VII

THE STATUS OF SCIENCE, MATHEMATICS AND SOCIAL SCIENCE IN WESTERN CITY, U.S.A.

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Bakersfield, California

June 1977

Western City in mid-California is a center of agribusiness with a considerable proportion of its population engaged in "agriculture and trades." The California city which Rodolfo Serrano portrays is not the progressive and thriving California of the sixties. Instead, it is a city with the same decay and decadence plaguing so many cities of the seventies. The hip California culture is not as visible as "country and western" culture, but the city is not homogeneous. It features diversity partly because of large Black and Chicano populations.

The schools studied--chosen from a K-8 district of all elementary and junior high schools and a high school district of seven high schools --were two junior high schools, several elementary schools and one high school. In nearly all the schools described, Anglo students accounted for only fifty percent or less of the student body. The dominant minority groups were Chicanos and Blacks. Serrano portrays these schools as rather bleak places for children; his tone is despairing. The problems of the schools include limited resources, lack of articulation, lack of parental involvement, and the encroachment of problems from the "outside world." Some of his conclusions are that the schools are reeling from desegregation, producing illiterates in science, lacking articulation and supervision, and declining in enrollment and resources.

The schools, in turn, are trying to cope with the realities of urban neighborhoods which are not only culturally diverse, but are also

locked into the cycle of poverty. Graduates from this district, as members of minority cultures, are likely to be assigned unskilled labor positions. Only two percent of the students go on to college. Serrano ascribes this result to the "culture differences" students experience in the schools. Reflecting his ability as a documentary film-maker, he provides through his choice of details a vision of the city, its neighborhoods, and the impact of cultural diversity on the schools.

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THE STATUS OF SCIENCE, MATHEMATICS AND SOCIAL SCIENCE IN WESTERN CITY, U.S.A.

Rodolfo G. Serrano

BACKGROUND

Western City is located in a rich agricultural area that produces a variety of crops throughout the year. Although its climate is mild and lacking in rainfall, Western City has become the center of large corporate agribusinesses in its part of the state; and these corporations have taken over, to a large extent, the development of the rural areas of the city. Their control of the water in this locale--by way of controlling water rights--has made them a powerful force in the control and development of this area.

This control extends, also, to the several smaller hamlets, averaging 15,000 in population, which surround Western City and which are also heavily dependent on agriculture and Western City for their survival. The uniqueness of these smaller cities, though, is in their contribution to the overall productivity of the area. Some of these towns are noted for their production of oranges; others for their production of potatoes, onions, almonds, cotton, grapes and the like.

Western City has a population of approximately 184,000. The ethnic makeup of the community is approximately 74% Anglo, 16% Mexican American, 8% Black, 1% Oriental, 1% other (July 1, 1976). These numbers are significant because the labor force for Western City and its agribusiness comes from these groups (especially field labor). Accordingly, the government and the general services areas employ approximately 37% of the work force while agriculture and the trades employ approximately another 37% of the labor force. In Western City, where the ethnic population is 26% minority (non-Anglo), most of this part of the population is engaged in field agriculture-related activity. For a general population that has a 12.1 median grade level attainment, the ethnic minority membership has a grade level attainment of 8.9 (based on Twenty Key Census Tracts for the Greater Western City Area). Also important to the economy of Western City is the oil industry and its related services. The economic contribution of this industry is not to be underestimated, though as a driving force in local government and the schools, its influence is a matter yet to be determined.

The city itself is also noted for its country and western type atmosphere. It attracts country and western singers and other related activities such as the rodeo. The community as a whole supports these activities, and it is not uncommon to hear such expressions as:

"Once an Okie, always an Okie."
"What's wrong with being Okie?"

Country and western singers are abundant in Western City, and one of the main attractions is a nationally known TV celebrity who resides there. His contributions to the overall development of Western City are not to be minimized, because he has brought the city national exposure.

The importance of the makeup of the community--Western City--is that the problems that develop because of such diversity inevitably have a tendency to make their way into the

public schools. This is evident by way of the de facto segregated schools that still persist in the community, the heavy preponderance of ethnic minority members holding unskilled labor positions (agricultural field hands), the problems related to cultural differences experienced by some of the students in school, etc.

THE PURPOSE OF THIS STUDY

For the last five months, Western City has been the focus of this investigation. In particular, it has been the intent of this investigation to determine the status of science, mathematics, and the social sciences in the public schools in Western City. The procedures followed in this study included the method of the anthropologist--participant observation--as well as the method of secondary analysis. Many trips were made to selected public schools, including elementary, junior high schools, and a high school. Classes were observed while in operation; discussions were held with students, teachers, and administrators; and interviews were also conducted with students, teachers, and administrators. Analyses of other studies conducted in Western City were made, as well as analyses of census reports and other documents available, that provided information on the characteristics of Western City. It was the compilation of these data that made available the resources necessary for this report. What follows, herein, is a synthesis and an analysis of these data.

THE SCHOOLS IN WESTERN CITY

Educational policy is determined by two separate school districts in Western City. Western City School District (W.C.S.D.) establishes policy for the grades K-8, while the Western City High School District (W.C.H.S.D.) operates the education system for grades 9-12. The W.C.S.D. enrolls approximately 18,400 students in its thirty-six elementary and junior high schools. The district employs 867 teachers (including counselors), and 77 administrators. The numbers do not include those administrators who perform their duties out of the Superintendent of Schools' office. The W.C.H.S.D. enrolls approximately 18,800 students in grades 9-12. The district administers twelve high schools within the county--eight of these schools are found within the city boundaries. The district has 803 teachers and 135 administrators under its employ.

Within the city boundaries, the W.C.S.D. has thirteen elementary schools, of which six took part in this investigation. These schools were located close to the center of the city and were selected because of the close ethnic approximation to the rest of the city. They were also selected because they were identified as feeder schools to two of the local junior high schools.

The two junior high schools selected to participate in this investigation were similarly identified; i.e., proximity to the center of the city and feeder schools to the most central high school. Junior High School I was located in a southerly direction, while the Junior High School II was located in the "Heights" (northeasterly) area. Junior High School I is located in a predominantly Black neighborhood while Junior High II is located in a predominantly Chicano area.

Junior High School I - break between periods

Junior High School II - break between periods

Western City High School is one of seven high schools in the city. It is located near the center of the city and receives its largest number of students from Junior High School I and Junior High School II. W.C.H.S. is located in contiguous fashion to Black, Chicano, and Anglo neighborhoods.

Western City High School - changing classes

W.C.H.S. was the only high school in the city for a number of years and until recently (1956) was used by the junior college district for its classes. W.C.H.S. is a proud school: it claims among its alumni a number of athletes who have made it to the professional ranks, movie stars, television celebrities, well-known medical doctors, university professors, and men in high state and federal governmental offices. Community members, at times, refer to W.C.H.S. as a sister institution to the junior college, not realizing that the high school is in a totally different school system. The relationship between the junior college and W.C.H.S. is a close one, particularly when close to 47% of its graduates matriculate to the college. During the fall of every year the significance of these figures becomes apparent when the names of football players who used to play for W.C.H.S. are now heard playing for the junior college. As in any community, when there is a rallying point, the community as a whole is quick to defend "its" team and "its" players, regardless of color of skin, cultural identity, or place of origin.

The Elementary Schools

The elementary schools that participated in this study were selected primarily because of their ethnic composition, their proximity to the junior high schools, and their geographical location with respect to W.C.H.S. On the average, their student body enrollments were approximately 530, with eighteen teachers, fifteen teacher aides, one teacher counselor, one

counselor, one curriculum specialist, and one principal. The ethnic distribution for the schools was approximately 56% Anglo, 40% Chicano, 3% Black. The enrollment pattern that persists is one of "no growth" or of a slight decline. This is attributed by school authorities to the slack in birth rate. In any event, school enrollments are relatively steady at Western City.

The Science Program

The science program in the elementary schools at W.C.S.D. is almost non-existent. The inclusion of a science program, like any other program, is left in the hands of the building principal. If the principal decides that the program is important enough, he/she can decide to include it as part of the school curricula. The pattern found at W.C.S.D. is one in which most building principals find themselves limited as to time because of governmental (state and federal) impositions placed on their programs if they receive state or federal monies. These impositions include time limits (100 minutes) placed on physical education and/or required time allocations needed for the other twenty some-odd areas of study, including science education. (Please see comment of Director of Instruction, page 7-39.)

Building principals are also constrained by the amount of time they have to allocate to testing. This testing is performed in order to satisfy federal, state, and local requirements. Again, this comes about because: (1) it is dictated by the agency that provided the monies; (2) to insure that the monies will be forthcoming, efforts have to be made to show the authorities that the money is needed; and (3) it must be done in order to satisfy the local school board that things are being accomplished by the schools. This last item is not very often undertaken; but when it is, it is found to be time consuming. As one principal explained:

> *. . . It gets to the point where you can't do very much. If you're not getting it from the State, you're getting it from the "Feds." We just don't have enough time to do all the things we would like to do. You have to establish priorities.*

One of the concerns expressed by some principals now involves bilingual education. The state-ordered plan that directs all school districts in the state to develop bilingual programs where there are fifteen or more youngsters who do not speak English is seen as infringing on the time now allocated to other subjects. One principal stated it in this fashion:

> *If you start with one language, where will it end? There are so many languages that people speak around here. We have Basques, Filipinos, Native Americans, Germans, etc. Where are we going to get the teachers to teach these youngsters? It's insane to ask the schools to do all of these things.*

The problem is a real one that needs to be addressed soon. It does seem plausible, however, that if bilingual teachers could be found, the curricula and the various and sundry programs could be handled in the foreign language of the youngster (in this case, Spanish). This is a much larger problem that needs special attention in order to establish any modicum of satisfaction.

While time is a critical factor in the implementation of the W.C.S.D. curricula, the faculties at the various schools are also harried by the various teacher organizations throughout the year. "If it isn't pay schedules, it's textbooks; if it isn't programs, it's class size . . ."

> *We have been negotiating salary contracts with the district [elementary district] for a long time and seem to be getting nowhere. If a strike is what they want, a teacher strike is what we will give them. . . . We*

aren't asking for something beyond the means of the district . . . we only want a salary and working conditions that are appropriate to our jobs . . . (Teacher Comment, 1977).

Similarly, mandatory meetings, parent-teacher conferences, and professional organization meetings take a considerable amount of time from the teachers. The little time that is available most teachers would prefer to have to themselves:

By the end of the day, I'm just pooped! Having to run off some papers and get the class ready for the following day, doesn't give me enough time. Then teaching all those kids all day long is hard. By the time you think about the things you have to do and the next day . . . it's time to start all over. There just isn't enough time during the day to get all things done I want to do (Teacher's Comment, 1977).

As a consequence of all these time constraints, the science program at the elementary school level in Western City is almost non-existent. This is somewhat surprising because in 1972-76, the local state university initiated an NSF Elementary Science Project for teachers. (Please see comment of Director of Instruction, page 7-39.)

Nearly 300 individuals from schools in . . . the county participated in some way in the various projects during the four-year period 1972-76. Many of the teachers were involved in more than one project (ESS, USMES, SCIS, ISCS). Included among the 300 participants were 65 administrators who had directly or indirectly been associated with various aspects of the project (State College Document, 1976).

At the time we sent one teacher from each school and the principal. Schools chose the particular science program they desired and this was purchased for the school; S-APA for most, U.S.M.E.S. for a few. Six junior highs were supplied with S.C.I.S. laboratories.

It undoubtedly is true, in terms of priorities, that schools pay less attention to some areas of the curriculum than others. When trying to implement all that is to be taught in a 230 minute day (first grade) to a 300 minute day (sixth grade) and a little longer (seventh & eighth grade), it does become difficult (Administrator's Note).

For various reasons the elementary schools appear to be giving up the science programs that numbers of them had established a few years earlier. In particular, it appeared as though E.S.S. (Elementary Science Study), S.C.I.S. (Science Curriculum Improvement Study), and S-APA (Science - A Process Approach) were programs that were going to unfold and blossom. But this was not the case as evidenced by this study. Of all the schools visited, five years after the state college project was started, there was only one school that was utilizing one of these programs. In this school the S-APA program was being used on a one-semester basis--and only in a modified form. The teacher explained:

The children in grades K-2 receive twenty minutes of instruction a week. Third graders receive two hours per week of instruction. The fourth, fifth, and sixth graders receive five hours of instruction every third week.

When asked about the success of the program, he stated that he thought the program was very successful. Even for such short periods of time, he thought the time was well worth the efforts. The "kids seem to enjoy it and they get excited about coming to science class," he stated.

The second grade students that were observed in a morning session appeared eager and interested in their assignments. They came in from an adjoining room and quickly went to the tables that interested them. The teacher gave them instructions and told them not to bunch up on any one table. One of the tables had a variety of materials to be weighed on a beam balance and

the students went right to work. Other students worked on puzzles and similar type games. All during the science session a variety of behaviors were noted, but my overall impression was that the students were interested and appeared to be having fun (Field Notes, 1977).

In this school where the S-APA program is used the most "extensively," they also have the problems of time allocation for the various curricular offerings. The reading program, the multicultural components of the early childhood program, and the numerous interruptions due to testing evidently do not interfere with the inclusion of elementary science at this one school. The school populations are slightly different, but the time schedules are basically the same. It would seem, then, that other schools should be able to follow this lead.

Mathematics and Social Science

Mathematics at the elementary level varies from school to school. Some schools use packaged programs such as the C.D.A. (Curriculum Development Associates), while others rely primarily on work problems on dittoed sheets. A large number of teachers prefer to "scramble and choose" those materials they think would be most beneficial for their students. As a consequence, unless the teacher has a few years of experience, a good amount of time is spent hunting for appropriate materials for the students.

From the state level, testing is required of all students. In some cases testing of the students is performed two and three times a year, particularly at the fourth, fifth, and sixth grade level, and this again is very time consuming:

The students have to be prepared before the test, well in advance. None of the schools want to come out with low scores. Low scores would mean that we have not been doing our job (Teacher's Comment, 1977).

The pressure for high score attainment is real in the W.C.S.D. The schools in our sample reflected this pressure; yet there was little, if anything, the teachers could do to eliminate this undue pressure for higher scores that would indicate high achievement in mathematics.

Yet achievement is <u>not</u> high; at least, not consistently so. Of the three main ethnic groups in the W.C.S.D., the Chicanos are the ethnic group that exemplifies the loss of mathematics achievement. By the end of the sixth grade, the Chicano group is reading almost two years behind grade level and is over one year behind grade level in mathematics. Whether this is due primarily to language difficulty is not known, but there is some evidence that indicates part of the problem:

. . . just arrived from Mexico. We have him sit over there because no one can understand him. He hasn't learned to speak English yet. When he gets to the point where he can understand English, we will start him on math and some of the other areas . . . (Teacher's Comment, 1977).

While variation exists from school to school in mathematics instruction, the situation for social studies is even more pronounced. In social studies there appears to be no commonality of subject matter content utilized in any of the schools. The materials used vary with every teacher. When asked about this particular area, most teachers responded that this is one area that is dealt with only tangentially. They are not concerned with this area of science per se because their concern is more with reading, writing, spelling, arithmetic, and art.

Most classrooms display a large variety of posters, pictures, and other colorful materials. These materials are usually found on the bulletin boards and on the walls. Most of them carry a message that in many instances might be hard for young children to grasp:

> *In one classroom there were a number of magazine pictures depicting life in India. Some pictures were of young children playing in a field. Other pictures illustrated Indian architecture and street scenes. Of what benefit could these be to young children (third graders)--without introduction or some semblance of how they fit into the program? (Field Notes, 1977).*

Text materials in the social sciences for the first three grades are not available as social science content material. If they were available to the elementary schools in Western City, none were seen being used. The only materials in this area that were being utilized were weekly publications that were intended for the reading area but were being used in conjunction with social studies. In grades four, five, and six, the emphasis was not observed to be much different from that observed in the early grades.

The final authority for the school curriculum in Western City rests with the local school board. The building principals, then, have a tremendous responsibility in assuring the district that a reasonable curriculum is being implemented. All the teachers, in short, must follow a plan that will insure "success" in their respective classrooms. Thus, the selection of qualified teachers is important to the principal because they are the people who carry out the planned curriculum. Any breach of trust between principals and teachers could result in programs that might not be successful in meeting the needs of the students.

> *. . . There is a board adopted course of study which outlines what is to be taught in all three areas of study. . . . Also for each grade and subject there are curriculum guides which the teacher can use to implement the course of study and the instructional materials. The state laws . . . mandate that each elementary district adopt such a course of study. . . .*
>
> *Principals are reminded at meetings throughout each year that this is a requirement. As each area of the course of study is revised (by committee) it is sent not to the district at large . . . the document is sent to the board for adoption.* (Please see comment of Director of Instruction, page 7-40.)
>
> *Curriculum guides are written by teachers' committees outlining the "what to teach" area, "ways of teaching it" and the various materials available to teach. These include books, maps, charts, films . . . listed in the curriculum guide (Administrator's Note).*

Parent-teacher advisory committees at the elementary level have very little if anything to say in the areas of science, mathematics, or social science. While most parents are concerned about their children learning math and science, parents in the W.C.S.D. accept what the teachers are willing to do in these areas. The parents are consulted only superficially for their advice on curriculum matters through the P.T.A. and other advisory bodies. Their "input" into policy making decisions is next to non-existent.

The Junior High Schools

Two junior high schools from Western City were selected for purposes of this study. Their geographical location and their student populations were key considerations in their selection. Junior High School I (often referred to as the "Black school") is located in a southeasterly direction from the high school, while Junior High School II (the "Mexican school") is located in a northeasterly direction from it. While these labels do not truly

represent ethnic distribution of the schools, that is the way to which they are referred by the population at large (Table 1).

TABLE 1

School Enrollment and Distribution
of Junior High Schools I and II

	Junior High School I	Junior High School II
School Enrollment	483	606
Number of Teachers	26	29
Counselors	3	2
Principals	1	2
Clerical Staff	2	2
Ethnic Distribution		
Anglo	42%	41%
Chicano	16%	56%
Black	38%	2%
Other	4% (Oriental)	1% (Native American)

The community around Junior High School I is predominantly Black with a few Chicano and Anglo families mixed in the neighborhood. The school itself is located directly across from a city park where drugs and marijuana are sold without difficulty. This poses a big problem for the school because the students are easy prey for the older teenagers and adults who frequent the park on a daily basis. As one of the teachers observed:

> *. . . That's why this school had to be fenced in. . . . There were a lot of trouble-makers and drug pushers very close by. They were getting so close that the problem was getting worse. Even now we find some of the younger people--some of our students--not only taking drugs or smoking marijuana but also selling it on campus. We have it somewhat under control now but the problem is still here.*

While the problems with drugs, marijuana, and glue sniffing are still around the school, by-and-large it is a healthy institution. Numbers of its graduates continue to high school and do very well--both academically and in athletics.

In contrast, while Junior High School II also has its problems with drugs, marijuana, and glue sniffing, they are not to the extent found in Junior High School I. The neighborhood around Junior High School II appears to be somewhat better maintained and is not surrounded, as is Junior High I, by public facilities that draw drug pushers and hang-arounds.

The Science Program

Science instruction at both schools is offered at the discretion of the building principal. If the principal has no interest in science, the science program at either school would fail to exist. As a consequence, the science program at both schools is a minimal program and is only as complete and thorough as the teachers who instruct in the program make it. The following observations (made during site visits) tell the story.

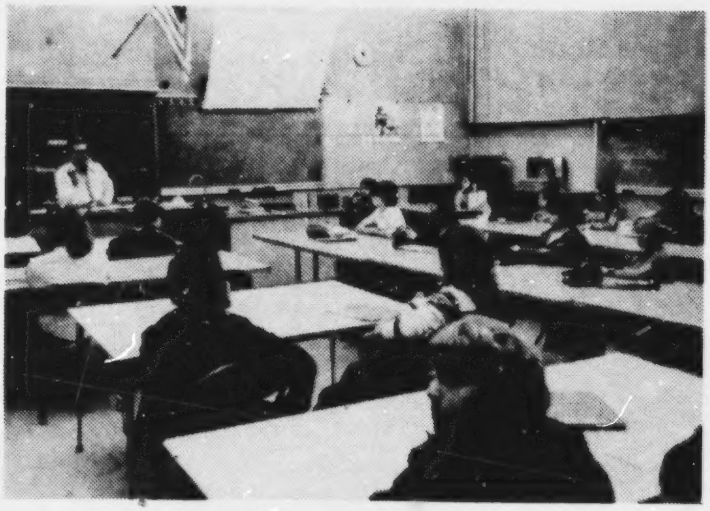
At Junior High School I, the "science room" is almost bare. There are some bulletin boards but they, too, have only a few items about earthquakes tacked on them. The storeroom is also badly supplied. There are three microscopes that are in semi-operable condition, a few unlabled chemicals, a few pieces of broken glassware (thistle tubes, test tubes), and a Fisher burner and a Bunsen burner. There is no evidence of any packaged kits (such as I.P.S. kits) or other pieces of equipment that would indicate that the students would have some experience with hands-on equipment. The science room has desks and only a few tables are available in the room. The principal is making a great effort to upgrade this area.

The "science room" at Junior High School II is not in the same condition as the science room at Junior High School I. While the walls are still relatively bare, the closets are filled with I.S.C.S. (Florida State Science Program) packaged kits. There are ample supplies of glassware, hardware, and chemicals normally used in a junior high school science class. The collection of rocks and minerals is minimal, as is the preserved animal collection. Relatively speaking, the science room is much better supplied and organized at Junior High School II than the science room at Junior High School I.

The science program at Junior High School II has been well established by the instructor (one of the participants in the State University Project) who has been at Junior High School II for three years. He follows a course of study that he has developed over the years and continues to modify it, utilizing I.S.C.S. materials as time goes on. His counterpart at Junior High School I, on the other hand, appears to flounder in the science area. At Junior School I, a considerable amount of time is spent studying earthquakes ("Since we live in an area that is earthquake prone, I feel the students should spend some time studying earthquakes"). Besides earthquakes, there is not much evidence of other science topics being discussed nor is there any evidence of students having an opportunity to get their "hands on" any equipment.

Because the science program at the junior high school level is left up to the individual schools and the respective science teachers, there is a wide range of areas and approaches that are used by the science teachers. Some science teachers in Western City have attended NSF institutes and are well versed in a variety of programs (I.P.S., I.C.I.S., I.S.C.S.), but do not use the materials exclusively. A great number of science teachers in the district are not aware of the existence of these planned science curricula and their packaged equipment and, as a consequence, do not use them. The following observations were made during the course of one week while visiting the schools:

At one junior high school, the science instructor is busily moving around from table to table talking to the students about the exercise. The lesson for the day has to do with the measurement of force. The students are supposed to come up with some idea as to how to measure forces (Figure 1).



Junior High School II - a science lecture

Junior High School II - science students

Number of Sinkers	Distance Rubber Band Stretched (cm)
5	
4	
3	
2	
0	
1	

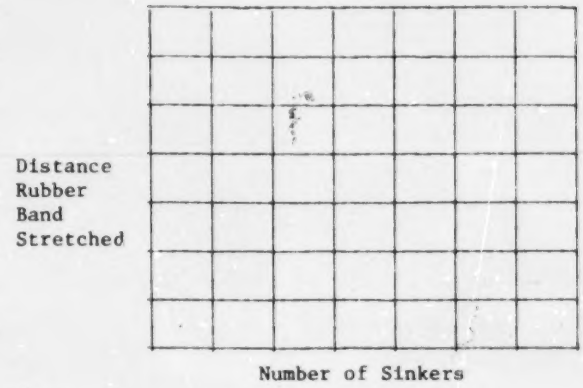


Figure 1. Measurement of Force Using Lead Sinkers and Rubber Bands

At another junior high school, the students are sitting at their desks listening to a lecture on nutrition. From time to time the class is admonished for not listening. On one occasion one of the students was severely reprimanded for chewing gum and given a lecture as to why gum chewing is not allowed in school.

At Junior High School I, the students are given an assignment. The assignment for the day is to copy the major geological fault lines that are found around the state. This is to be done by looking at the large map on the wall that was supplied by the State Department of Mines. A discussion of the distribution of fc ılt lines was to take place towards the end of the period.

The teachers, when asked about their major concerns about the science program at their respective schools, responded accordingly:

Junior High School I

The students lack discipline. They make little or no effort to learn. They would rather talk and delay the teaching process. They are the ones that will suffer the most.

Junior High School II

The biggest problem at the school is absences. The students don't seem to care. They would much rather be somewhere else. Discipline is not as much of a problem here as is the lack of supplies and equipment. I always have to be on the lookout for equipment.

These expressed concerns by two faculty members from different schools are not necessarily the two most pressing concerns in the district. Other teachers in the same schools have voiced concern about such things as:

1. Lack of administrative support for their programs
2. Lack of supplies and equipment
3. The continued use of outdated books
4. Large classes
5. Lack of student motivation
6. Lack of parental interest in their children
7. Lack of adequate facilities in order to conduct their programs.

Also mentioned quite often were the lack of student discipline and absences from the classroom.

In the same conversations, when the science teachers were asked to describe a typical day in their science classes, the following is typical of the description made:

> *The kids come into class as soon as the bell rings. We check their homework (this is done for purposes of reinforcement). We present a short lecture (at least twenty minutes) on a given topic. We make an assignment for the following day. On Fridays, we schedule quizzes based on the last four days of work.*

It is true that the description above is a rough approximation of a "typical day" in a science class, but it is important to note that science teachers at both Junior High Schools I and II made approximately the same statement in response to the question about a typical day in a science class. Field observations would indicate that their descriptions are not far from wrong.

Junior High School II - science students

Finally, the extent of intra-school communication for purposes of sharing ideas with other science teachers and for purposes of borrowing or trading equipment is non-existent in W.C.S.D. This is especially true of the science area. The specialist from the City Central Office makes little, if any, effort to call the science teachers together at least once a year. There are no in-service workshops offered by the City Central office and this in turn makes it very difficult to establish any dialogue among or between any of the science teachers in the district. This is true despite the statement made by one administrator:

> *Regular meetings are held with department leaders (formerly chairmen) by the Junior High School Consultant. These people . . . are responsible for assisting with curriculum in the various junior highs.*

When the question of articulation between the science taught at the junior high school level and the high school was raised, none of the science teachers remembered if a meeting had ever been held between the two groups. The specialist assigned to this area from the district level, it was determined, was apparently too busy doing other things more important than attempting to call a meeting such as this. The science teachers at both schools indicated that such a meeting would probably prove to be very worthwhile. In the meantime, it is apparent that the status of science at the junior high school level is at an extremely low ebb at W.C.S.D.

The Math and Social Studies Program

The mathematics program at W.C.S.D. is consistent throughout the city. All students are required to take math in grades seven and eight. The classes are "tracked" into three and at times into five levels, depending on the student scores on the C.T.B.S. (California Test of Basic Skills). Classes supposedly average better than thirty students, but field evidence indicates an average closer to twenty per class. (It is not determined whether this was due to absences only or whether it was a combination of absences and class changes.) (Please see comment of Director of Instruction, page 7-40.)

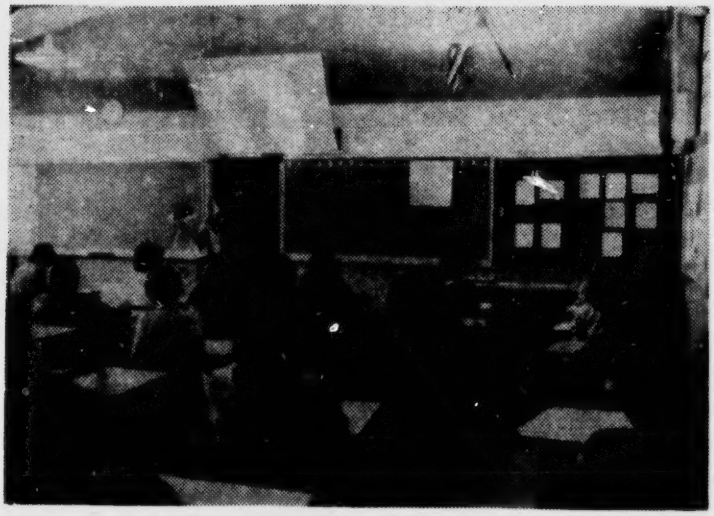
Since mathematics is a required class at the junior high school level, the schools normally have four or five full-time math teachers. Mr. Doe's classroom is a good example of what most math classrooms look like:

Mr. Doe has been at Junior High School II for six years. He transferred from Junior High School I and is currently teaching five classes of math a day. The class periods are forty-eight minutes long and this gives Mr. Doe an opportunity to try out different approaches in class. "His" room is neat and clean and what few posters, announcements, and papers are tacked on the bulletin board make the room look sterile. At the front of the room there is an opaque projector with pencils. To the side of the teacher's desk are two tables where reference books and students' papers are found. Alongside the north bank of windows is a counter that holds the students' books. When the bell rings fifteen minutes after the hour, the classes are ready to begin.

Math instruction in W.C.S.D. also follows a common approach. As exemplified by Mr. Doe, the pattern of instruction is as follows:

The bell rings and some of the students run into class; other students drag in up to four minutes late, only to be reprimanded on the spot by the teacher. After some commotion, the class begins with Mr. Doe making a few announcements. Students are asked to pull out their homework and papers are exchanged. After twenty minutes of exchanges between teacher and students, the teacher announces the subject for the day. He presents the new material for fifteen to twenty minutes and then makes the assignment for the following day. The students commence working on the new assignment until the bell rings for them to go to their other class.

This description is not an unusual situation. As typical days go, this pattern of class presentation was observed many times in mathematics classes in W.C.S.D. On occasion there were a few, but not many, classes where game-like activities were observed, as were some drill-testing activities. The most characteristic activity was the bookwork assignment at the desk.



Junior High School II - Mathematics class

W.C.S.D. provides a variety of materials for mathematics instruction. The texts most commonly used with the top level students (level one) include: Modern School Math by Dolciani, et al., and Essential Skills in Algebra by Dolciani, et al. For the lower level student (levels two through five), Mathematics Around Us (Holt, Rinehart, and Winston) is the text most commonly used in the schools. For individualized instruction the district provides the S.L.I.M. (Systematic Learning in Mathematics) packaged materials to all the junior high schools. Similarly, the district also provides a variety of mathematical games, math ditto masters, tinker toys (for geometry), and other reference books, in an attempt to provide for individual student differences.

Since the district provides materials for student use, there appears to be little, if any coordination between and among the junior high schools and the high schools. The one individual placed in charge of coordinating math and science activities is also responsible for coordinating all the other areas of the curriculum. The result is that junior high school personnel never get to compare notes with each other; and similarly, they never get an opportunity to talk to the high school teachers about their program and the problems they face at the junior high school level. This lack of coordination and communication is a problem area that a few math and science teachers voiced some concern about in discussing their programs.

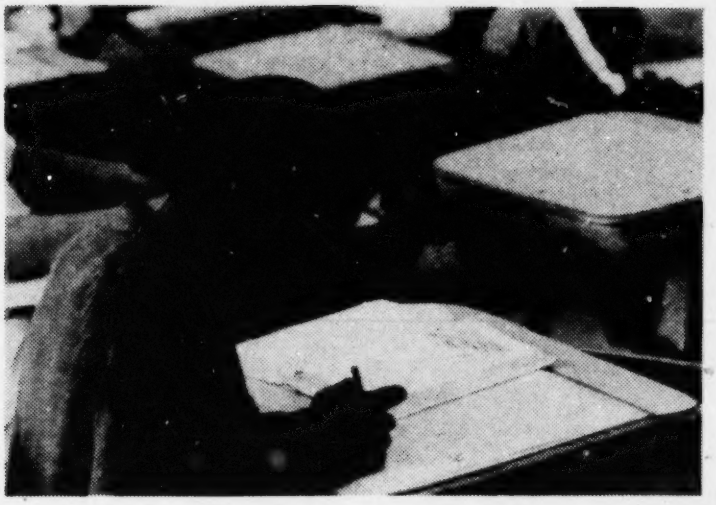
In the social studies area--G.H.C. (government, history and civics), as it is more commonly called in the W.C.S.D.--a great variety of programs exist. This is brought about because every student in school is required to take G.H.C. every year that he attends junior high school. Consequently, every school has fifteen to twenty classes of G.H.C. and there are approximately four full-time teachers involved in the instruction of G.H.C.

Junior High School I - mathematics class

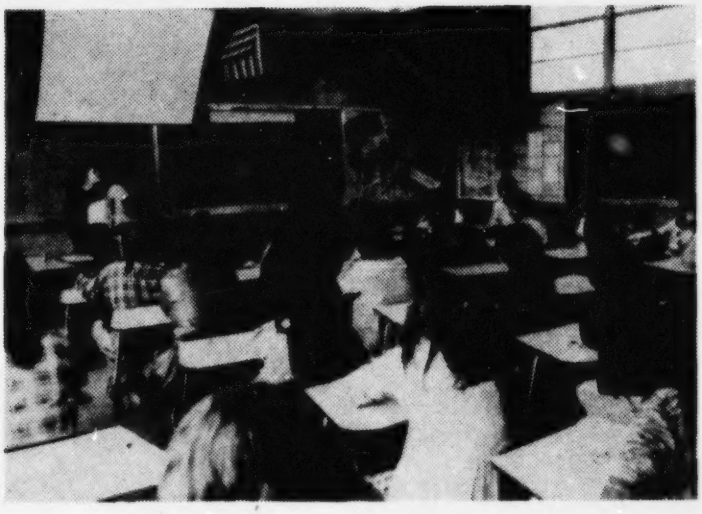
The textbook materials most commonly used in the program throughout the district include the texts: Quest for Liberty (9th grade), We, the People (8th grade), and Exploring Regions of the Eastern Hemisphere (7th grade). The district also provides several other reference materials (mostly books) for the G.H.C. program. These materials, while they apparently serve the prupose well (most students graduate from junior high school), are also a major source of teacher discomfort. While some teachers complain about the level of difficulty of the texts, or that the materials in the text are outdated, others praise the texts for their traditional materials and the fact that students learn something from them. Generally, most teachers interviewed did not like the textbooks provided by the district for G.H.C. instruction.

Most teachers are also quick to point out that supplies are a "big problem."

The district doesn't give you any support. Most of the things you see in this room are things that I have bought. There are posters that I have had to buy myself with money out of my own pocket! Do you know that the district will not even buy a world map for this room? . . . A lot of these kids would do much better if we had (audio) cassettes and reading material dealing with people and events. You know that a lot of these kids can't read well-- a lot of them are reading way below grade level . . .



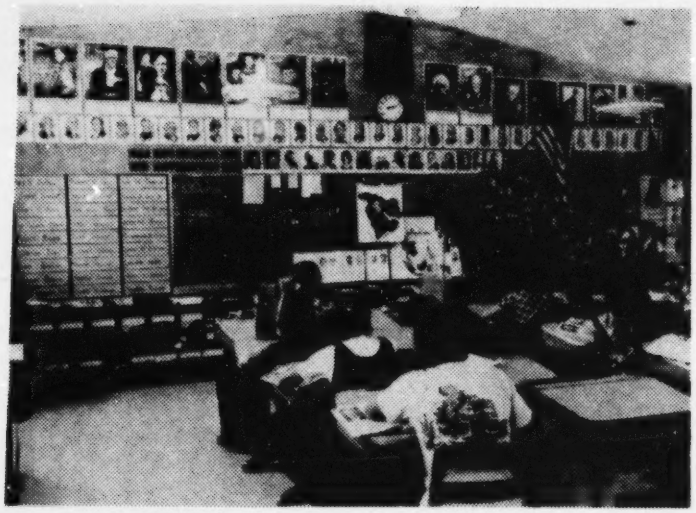
Junior High School I - mathematics student



Junior High School II - practicing G.H.C.

Junior High School I - reading G.H.C.

Junior High School I - doing G.H.C. homework



Junior High School I - a G.H.C. class.

There are a large number of teachers involved in the G.H.C. area, and instruction appears to cover the full gamut of approaches and methodologies. Some teachers are very didactic in their approach; others are very open and laissez faire in their approach to the subject. Those teachers who opt for the straight lecture-discussion method appear to have less respect from the students. Similarly, they are also the ones who have the most discipline problems, particularly from the ethnic minorities. At the other extreme, those teachers who attempt to individualize their instruction but still retain a little amount of lecturing and drill are the ones whom the students look-up to the most. As one student commented about a popular teacher who attempts to individualize instruction:

> *He's cool! He's not stuffy like some of the others. He lets you talk and likes to get discussions going in class. . . . He gives you work to do but it's fun . . .*

Other students have also commented on other teachers:

> *. . .He is a bore . . . all he wants us to do is to color the maps.*
> *. . .What I don't like is sitting and reading.*
> *. . .All we do it sit and watch films.*
> *. . .He is neat! We get to talk about what's happening in the world . . .*

The approaches to the subject matter, the methods used, the content of the course, are blended together by the various teachers in many different ways. Their success with the students is dependent upon a variety of factors, but one which readily stands out is the teacher's ability to communicate with the students at their level. This one factor

predominates over all others including lack of supplies, outdated books, large classes, and lack of administrative support. The classroom atmosphere that is generated by a teacher who can talk to the students with empathy and understanding is very obvious, but not very catching. This is the case of one teacher in Junior High School I. The students greatly admire this teacher for his understanding and humor but they also work for him when he directs them to do so. The kinds of activities that he involves them in are also critical.

> *At one time Mr. Smith had some of his students working on locating countries on a map. Other students were working on reports that they were to give in class at a later date. Still another group of students was involved in reading some assignments they had missed. . . . The classroom had an aura of accomplishment. Something was happening and the majority of the class was involved doing something constructive for themselves or for the benefit of the class. Even the posters on the walls were colorful and drew attention.*

The majority of the teachers in the G.H.C. area are teachers who have been trained in their teaching area. None of these teachers has ever attended a National Science Foundation Institute in the social sciences to strengthen his or her background, but a large number are enrolled in the local state university and take courses in their field regularly. To what extent this aids (by providing newer methods, materials, knowledge) or hinders (by providing weak content and bad instruction) their instruction at their respective schools has not yet been determined.

With respect to parent participation in these areas of science and mathematics, it is safe to say that parents do not contribute to the development of any of the existent programs. Parent involvement in these areas was never observed nor mentioned during the course of this investigation.

Junior High School I - the library

The High School

Western City High School is located near the "downtown" area of the city. The south boundary of the school is a main cross-town avenue which is heavily travelled, especially during the morning and late afternoon commuter traffic. To the north are the railroad tracks, while immediately to the east and west are roads that carry very little traffic in comparison to the south boundary thoroughfare.

The high school is one of eight high schools located within the city limits, one of which is a private Catholic school. The two main junior high schools that feed into Western City High are the Junior High Schools I and II, although a few students from other junior high schools in the city do transfer into Western High.

The student enrollment at Western High numbers approximately 2,500 (February 1977), and has an ethnic distribution illustrated in Table 2. The distribution by sex is approximately even for the total enrollment, as it is for the various ethnic groups.

TABLE 2

Western High School Ethnic Distribution

Ethnic Group	Percentage
Anglo	52
Chicano	23
Black	21
Oriental	2
Native American	1

There are 122 teachers on the staff at Western City High School. The ethnic distribution of the staff includes 111 Anglo, 4 Chicano, 6 Black, and 1 Oriental teacher. The principal classroom assignments of the ethnic minority teachers are as follows:

Chicano Teachers

Spanish
Industrial Arts
English
Physical Education

Black Teachers

Social Studies
Counselor
English
Physical Education

Oriental Teacher

Social Studies

All of the teachers at Western City High are assigned to teach in their areas of specialization. On occasion some of the teachers are asked to handle assignments in the area of their academic minors, but these are relatively few. The school also employs twenty-five teacher aides whose main function is to help the teachers--primarily as tutors in the classroom. Most of the teacher aides are assigned to other than ethnic minority members.

> *Desegregation is an issue that is yet to be resolved in Western City. The elementary schools are under Office of Civil Rights investigation and, as a consequence, H.E.W. has stopped all new funding of federal programs. Recently, the W.C.S.D. filed a counter suit against H.E.W. and is waiting for a decision from the court.*

The administration at the school consists of one principal (who recently passed away and was replaced by one of the assistant principals), one vice-principal in charge of instruction, one vice-principal in charge of pupil personnel services, one vice-principal in charge of administrative services, six full-time counselors (two part-time) assigned groups of students according to their last name, and fourteen members of the clerical staff. The clerical staff handles duties that range from secretarial (secretary to the principal) to bookroom (student book assignment) management.

In sum, the administration and supportive staff are typical of the supportive staff found in any of the high schools in the Western City area. The number of aides that are employed to work alongside the teachers is a much larger group (at Western City High School) than is normally found in the other local high schools. This is sometimes viewed by the other high schools with jealousy and at times with an air of condolence: "They need all the help they can get."

The Science Program

The science program at Western City High School includes all the courses commonly found in any comprehensive high school. At the tenth grade, world science has been modified into eleven mini courses from which the student takes two for the semester:

Human Biology	Chemistry
Ecology	Home Shelter
Microscope and Water Study	Genetics
Home Plants and Gardening	Zoology
Astronomy	Earth Science
Mechanics	

Biology and chemistry are offered at the eleventh-grade level, while physics is available at the twelfth-grade level. All science classes are Western City High are tracked--in a modified sense: this is accomplished by imposing course prerequisities with

corresponding grades. Most of the students at the school will take either world science or biology at the tenth-grade level. Either one of the courses will satisfy the graduation requirement.

Enrollments in science in general appear to be decreasing.

It has also been stated several times by different teachers and administrators that the reason for the decline was the increasing numbers of Blacks and Chicanos enrolling in the school. As Anglos have been leaving the neighborhoods close to City High ("white flight"?), Blacks and Chicanos have been moving in. This has had the general effect of decreasing scholarship and lowering of standards. Some teachers and administrators have also indicated that the situation will probably get worse before it gets any better. On the other hand, there is no evidence to indicate that this is really the case. The only evidence that is available is that there has been a steady increase in the number of ethnic minority members attending Western City High and an attendant decrease in science--chemistry and physics--enrollment. The local community college reports that while in 1967 the City High School matriculation rate to the college was 62%, the rate for 1974 was 47%. The community college also attributes the loss of enrollment from City High due to the end of the Vietnam War and other factors.

Despite the overall negative impressions, though, in the advanced science courses enrollments appear to be increasing slightly at Western City High. The following tables demonstrate the changes that are taking place at the high school.

TABLE 3

Subject Area Enrollments

Subject Area	Enrollments	Year
Science	924	Fall, 1975
Science	803	February, 1976
Science	855	Spring, 1977

The enrollments in Chemistry and Physics are indicated in Table 4.

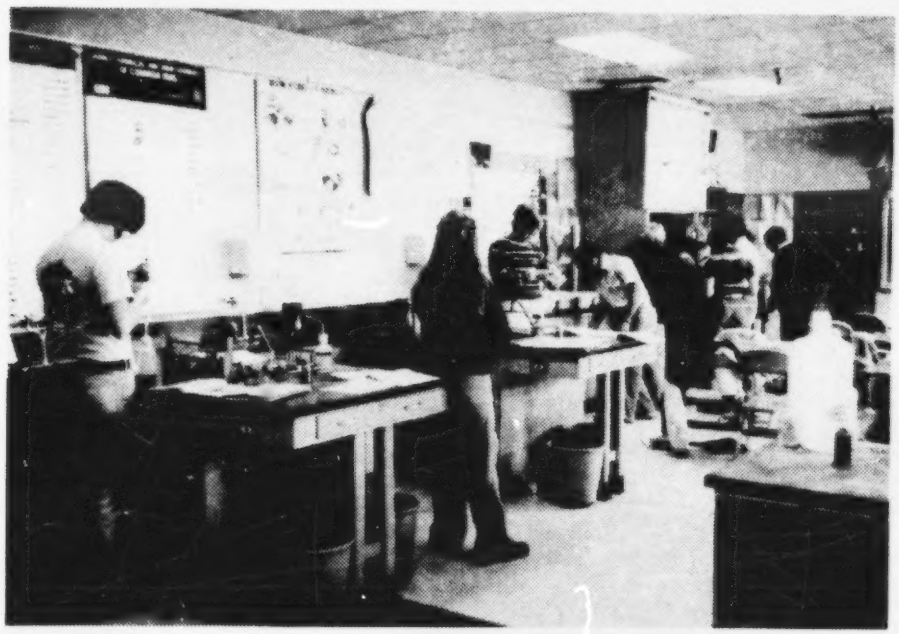
TABLE 4

Science Class Enrollments

	October 1975	February 1976	October 1976	February 1977
Physics	23	21	32	25
Chemistry	83 (3 classes)	66 (2 classes)	97 (3 classes)	85 (3 classes)

The importance of these figures (for chemistry and physics) lies in the slight increase in enrollments after several years of decline. Although the "increase is very small," the "signs of change are appearing," according to the chairman of the department.

Enrollments in world science remain relatively large while enrollments in chemistry and physics are relatively small. There is only one CHEM Study chemistry class, three general chemistry classes, and one Harvard Project PSSC physics class at City High. In the CHEM Study class there are twenty-four students, four of whom are Oriental students (two boys and two girls), and no Chicano or Black students enrollment. In the physics class there are twenty-two students, four of whom are Oriental students (two boys and two girls), and no Chicano or Black students are enrolled. Of the twenty-two students in the physics class, nine students are female.



Western City High School - chemistry class

An indication of student interest and teacher response to students is indicated below. Also suggested is a positive effect on enrollments when staffing changes.

In one visit to the physics class, the class was performing a laboratory experiment. They were working with the ripple tanks studying wave reflections and refractions. The class appeared to be engrossed with what they were doing. When asked about the length of time they spent in the laboratory in any given week, most of the students responded that they spent at least one day per week in the laboratory. When quizzed about their reading assignments, they also appeared to be well informed about what they were doing and

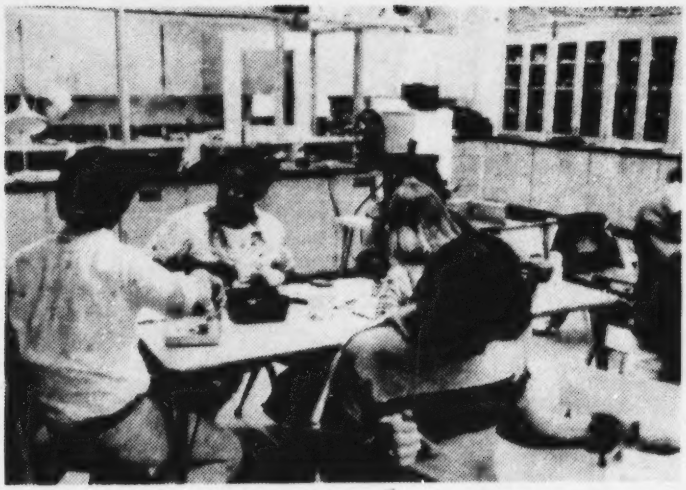
the theory behind their experiments. They were particularly complimentary towards their teacher, Mr. John. The class atmosphere was friendly and conducive to learning through "hands-on" experimentation. Mr. John, however, is leaving teaching at the end of this academic year. He is going to work for a private industrial firm.

In one of several visits to the CHEM Study chemistry class the instructor, Mr. Paul, had invited one of the local state university professors to speak to his class. The professor was lecturing and demonstrating a technique used in the identification of certain benzene related compounds. During the demonstration, the students indicated enthusiasm and interest for the class and a concern for the health of Mr. Paul. The relationship that Mr. Paul has established with his students is one of understanding and willingness to listen to their concerns. Mr. Paul will not be able to complete the academic school year and his class will be taken over by a substitute.

Western City High School - a chemistry demonstration

The faculty of the science department is composed primarily of male teachers. There is only one female member in the department and she teaches biology. The approaches used in the instruction of biology at West High are indicated from field notes:

Biology at City High is taught in the traditional way. The teachers prefer not to use the BSCS materials exclusively for fear that the students would not understand them. At one time, several years ago, BSCS materials were used unaltered, but since the student population has changed, the packaged



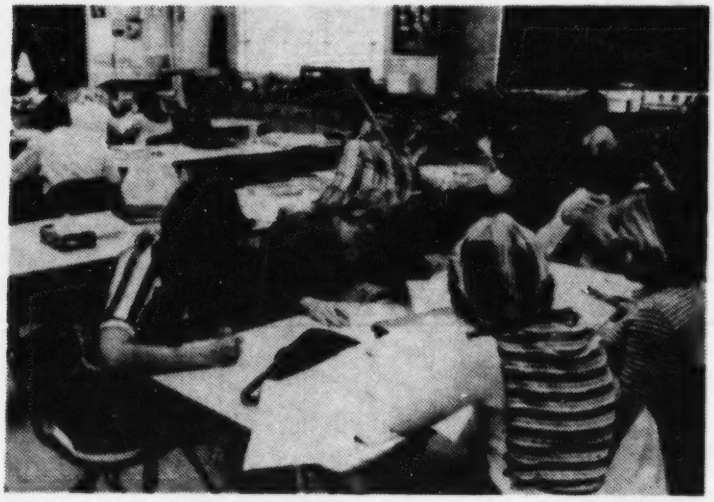
Western City High School - a biology class

Western City High School - a biology class

materials are no longer used. The course in biology at City High resembles the old Moon, Mann, and Otto variety of the fifties. It is interspersed with some basic materials but only sparingly.

Of the seven members in the department, only one (the chairman of the department, Mr. Paul) has attended an N.S.F. Institute (both a one-year and two-summer session institute). The other members of the department have not attended any institutes, although one member, the physics teacher, has a thorough understanding of the new curriculum and its laboratory orientation.

The science department at City High is well qualified to service the needs of the students in the science area. The lectures they present, the text assignments they make, and the laboratory sessions they conduct seem to support this contention. Most of the members of the department continue to present their subject in the "traditional" manner. Since very few of the faculty members are familiar with the more contemporary methods--the new science curricula--this might account for the little use of other than the traditional modes of science instruction at City High.



Western City High School - completing the report in science

According to some of the members of the science department, the biggest cause for concern within the department is student apathy. One member put it this way:

Students cut classes quite often and the administration doesn't seem to care. The classes meet only fifty-five minutes a day for four days a week with one day that floats. When you get students wandering around the hallways and

out on the grounds at all hours of the day, you know the administration doesn't give a damn. A few years ago--in any high school--the administration would never accept this. But around here, hell, anything goes. After an absence, the students are supposed to bring a pass slip in order to get them into class. Do you know that half of those students don't bring a slip to class? You send them back to the office and--you know they were cutting class--they come right back with a pass in hand.

The control against students' cutting classes or unexcused absences from class borders on no control at all. This concern was voiced by a large number of faculty members with greater frequency than was concern over supplies, equipment, or adequate reading materials. Student discipline and student lack of concern for the welfare of others is seen as a big problem at Western City High School, particularly by the members of the science department.

The following is a list of books used by the science department.

The World of Living Things	(10th Grade)
The World of Matter and Energy Brandwein. Harcourt Brace, 1964	(10th Grade)
Life Science - Challenge to Science Smallwood. McGraw Hill, 1973	(10th Grade)
Physical Science - Challenge to Science Williams. McGraw Hill, 1973	(10th Grade)
Earth Science Heller. McGraw Hill, 1973	(10th Grade)
Physical Science for Progress Pella. Prentice Hall, 1965	(10th Grade)
Modern Biology Otto and Towle. Holt, Rinehart, 1970	(10th and 11th Grades)
Interdisciplinary Approaches to Chemistry Chem. Assoc. of Maryland. Harper & Rowe, 1973	(11th Grade)
Chemistry Modules (7 modules) Devoe, et al. Harper & Rowe, 1973	(11th Grade)
Chemistry - An Experimental Science Workbook Pimentel. W. C. Freeman, 1973	(11th Grade)
The Project Physics Course Rutherford. Holt, Rinehart, 1970	

The Mathematics Program

In advanced algebra and trigonometry the enrollments appear to be on the decline, as illustrated in Table 5. The reasons for the decline are not fully understood, but some teachers have remarked that the reason is that the "overall ability level of the students at City High has been on the decline for the last several years," the implication being that the rise in Chicano and Black enrollment in the school is what has brought this about. One teacher stated: "These students are not interested in these areas of study! They are most interested in athletics and the arts."

TABLE 5

Mathematics Enrollments

Enrollment	Year
27	Fall, 1975
24	Spring, 1976
19	Fall, 1976
19	Spring, 1977

In the advanced algebra and trigonometry class the following ethnic distribution was noted: fifteen Anglo students; three Oriental students (two boys, one girl); no Chicano or Black students. In a general math class the following distribution was also noted: ten Anglo students, eight Chicano students, eight Black students, no Oriental students. These numbers are shown only to demonstrate the distribution of students as they are tracked into a program and to show the attrition rate noted during the course of the year. It is generally accepted at this school that the average class size is about thirty to thirty-two (peak average); but evidently absences, tardiness, and drop-outs are a big problem at City High School because most of the classes observed had only twenty to twenty-five students in them.

Western City High School - advanced mathematics

In one math class observed there were twenty-four students present. The teacher made some general announcements and then proceeded to discuss the homework from the day before. Proceeding slowly with the explanations, the teacher repeatedly asked if there were any questions. After the assignment was corrected, the papers were collected. The teacher proceeded to explain the problems and their solution. The teacher assigned six problems as homework for the following day. Since there was a little time left in the period, the students were told they could start on their next day's homework assignment.

At Western City High School, the total enrollment in the ninth-grade math classes is much larger than any of the other math classes. This is due to the fact that one year of math is required for graduation. Conversely, in the more advanced math classes, the enrollments are relatively low.

The faculty in the mathematics department is composed of fifteen members (ten males, five females). Of these, approximately six of the faculty members teach basic math (ninth grade), general math (ninth grade), or arithmetic (eleventh grade). Of the fifteen members of the department, two have part-time assignments in other departments. As a faculty, the members of the department are certified to teach in their respective areas. Two of the members of the department, including the chairman, have attended N.S.F. year-long and summer session institutes in mathematics. According to the chairman of the department:

The N.S.F. Institutes that I attended were well worth all the money. I'm sure that if I had not attended these institutes I would not have been able to do as good a job as I have done. I hope it's been good. A college graduate with a degree in math is not really prepared to teach high school. They don't teach you how to deal with kids and you also don't get much of a chance to get your head together with respect to math instruction. All math teachers should be encouraged to take an N.S.F. Institute at least every three to five years . . .

While some of the members of the mathematics department at City High have had some acquaintance with "modern math" programs and contemporary teaching methods (student experimentation and individualized instruction), it is interesting that the approaches they take in the instruction of the subject have a tendency to fall back on the lecture--presentation, discussion, problem assignment, quizzing method. This is not meant to degrade the method but only to ask the question, why? Do the students find the contemporary teaching methods more difficult to work with? The majority of the members of the department appear to have had little introduction to some of the contemporary teaching methods and the conceptual schemes found in modern math. As a consequence, the forms of instruction observed in the math department at City High are characteristic of "traditional" methods and include many textbook assignments and classroom problems of the "drill" type.

The basic texts used by the department include the following.

Elements of Mathematics Cousins. Silver, Burdett, 1972	(Gen. Math, 9th Grade)
Modern Algebra Dolciani. Houghton-Mifflin, 1970	(Algebra, 9th Grade)
Modern Geometry Jurgeson. Houghton-Mifflin, 1965	(Geometry, 10th Grade)

Mathematics for Daily Living McCormack. A. Lewis, 1975	(Gen. Math, 11th Grade)
Modern Algebra and Trigonometry Dolciani. Houghton-Mifflin, 1965	(Algebra and Trigonometry, 11th and 12th Grades)
Modern Analysis Dolciani. Houghton-Mifflin, 1964	(Trigonometry, 12th Grade)

The chief concern of a large number of the members of the department includes the lack of discipline on the part of the students. "Students seem to have lost incentive in learning mathematics, abhor drill, and anything that requires work." Most students, according to a large number of faculty members, "do not seem to be motivated; they prefer to sit back and complain all the time." One student, on the other hand, commented:

> *Our teacher is very old. _____ has been teaching a long time. _____knows her math but can't seem to explain it very well. The real top kids can understand it but the rest of us can't . . . They say this other teacher is also bad but Mr. _____ is good. They (the students) say he explains things and makes his class interesting (using a variety of materials). I hope I can get into his class.*

As for supplies and equipment, the members of the department generally did not seem overly concerned about this area. They all seemed to be satisfied with the amount and quality of the materials provided by the district.

The Social Science Program

The Social Science Program at Western City is one of the largest programs in the school, and is composed of the following courses:

California History	9th Grade
Geography	9th Grade
Current Affairs	9th Grade
Current History	9th and 10th Grades
World History	9th Grade
History	11th Grade
Current History	11th and 12th Grades
Government	12th Grade
Sociology - Economics	12th Grade
You and the Law	10th - 12th Grades
Business Law	11th and 12th Grades

The courses in the social studies department are not tracked per se; but (in ninth grade, for exmaple) most of the lower-tracked students are enrolled in geography and current affairs, while the higher-tracked students are enrolled in world history. By the end of their high school careers (graduation or withdrawal), most of the lower-tracked students will have taken only one or two courses in the social studies department, while the level four students will most likely have taken three courses (world history, history, and sociology-economics).

Western City High School - listening to a lecture on history

Because all students are required to take two courses in social science in order to graduate, enrollments in the department are inflated in the lower grades. But by the twelfth-grade level, for example, the enrollments in social science courses are relatively small. Many students even take government in summer school (between eleventh and twelfth grades). In one government class there were twenty-seven students observed (including three Black males and one Black female), while in sociology-economics there were only twelve students enrolled.

The perception that lower-tracked students take only the minimum number of courses in social science while higher-tracked students take more is not universally shared by Western City High administration, as the following statement by one administrator reveals:

> *All students take at least three courses--(any of several) social studies in ninth grade, U.S. history in eleventh grade, and government in the twelfth grade.*

The social studies department includes sixteen members, although two of the members have major teaching responsibilities elsewhere. The texts that are used in the classes include these:

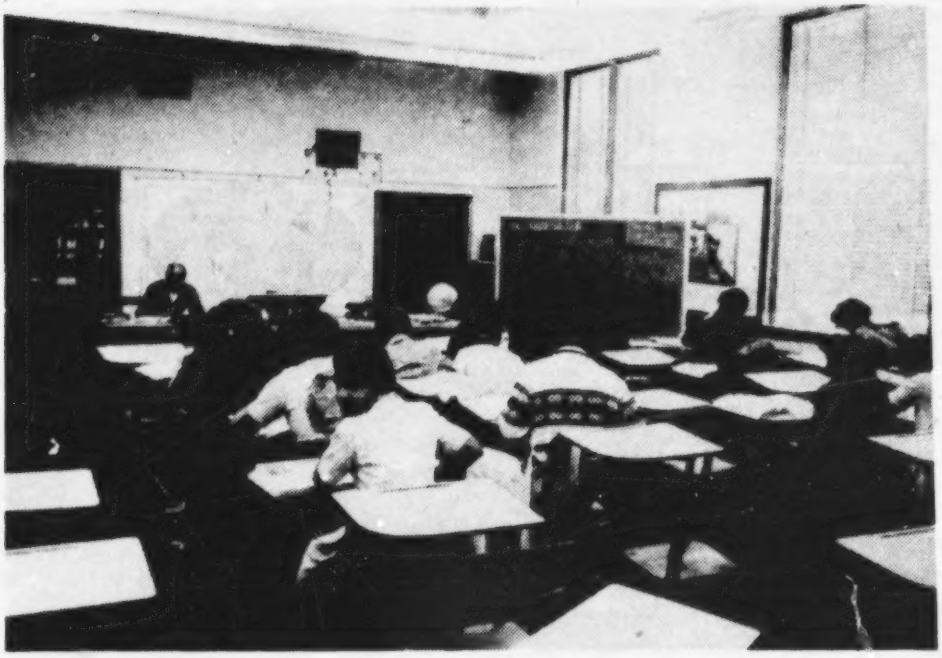
The California Story Wood. Fearon, 1970	(9th Grade)
Episodes in American History Burns, et al. Ginn, 1973	(9th Grade)
Story of Nations Rogers. Holt, Rinehart, 1962	(9th Grade)
Succeeding in the World of Work Kimbrell. McKnight, 1972	(9th Grade)
The Contemporary World McNeill. Scott, Foresman, 1975	(9th Grade)
This is America's Story Wilder, et al. Houghton-Mifflin, 1970	(11th Grade)
History of the Free World Bragdon. Houghton-Mifflin, 1973	(11th Grade)
The Growth of American Democracy Link. Ginn, 1968	(11th Grade)
Civics in Action Gross. Field, 1971	(12th Grade)
American Government Ludlum. Houghton-Mifflin, 1970	(12th Grade)
McGruder's - American Government McClenaghan. Allyn Bacon, 1976	(12th Grade)

The way in which these materials are used in class follows the more traditional method of instruction described earlier in the mathematics section: lecture-discussion, reading, questions-problems, quizzing. In some classes, the discussion periods at times get emotional and have a tendency to stray away from the topic at hand (personal observation). In other classes, serious attempts have been made to get the students to make better use of the library facilities. One ethnic minority faculty member commented:

> *In my classes I have to lecture. Most of my students don't know how to read or they are reading well below grade level. Consequently, I have to resort to lecturing (they can listen) and using worksheets. The attitude of my kids is good even though they can't do all the work assigned to them. I work with level one and two kids mainly.*

Of the fourteen full-time members of the department, only one is familiar with N.S.F. and its Summer Institute program. Similarly, only two of the members had any familiarity with the N.S.F.-developed packaged curricula. As a consequence, the department does not have any of the packaged programs that are now available to the social sciences from various companies. Most of the materials used in class are either teacher-developed or acquired from the district office.

The problems that seem to beset the science and math Departments at City High seem to be the same ones that are of concern to the social studies department. Student apathy, discipline, student motivation, and poor reading ability are the concerns that were voiced most often by the members of this department. Inadequate supplies, dated reference materials, lack of materials for the non-readers were also mentioned as problem-concern



Western City High School - a class in world history

areas, but not as often as the ones mentioned earlier. The lack of communication with the central office was also voiced as a problem that needed to be corrected. A few teachers also voiced their concern for the lack of parent involvement in the total school program (the high school has no P.T.A. or "Open House" during the year).

Thus, while the members of the department have their concerns about the students and the administration, they themselves are having difficulty in adjusting to the newer approaches to instruction and are having difficulty locating materials that are known to be available.

The teaching staff in the department are well qualified to teach in their areas of assignment. They all hold valid teaching credentials from the state. Their efforts are supported by six teacher aides who act as tutors during the regular class period. This service provided by the district, using special program funds (state), is invaluable according to some teachers because "it provides some individualized instruction for some students that really need help." The teaching staff, similarly, always appear to be on the lookout for materials that will make their classes interesting and motivating. This is evidenced by the fact that, even with a small operating budget, the department, through its chairperson, continues to satisfy the requests made by the various staff members.

> *. . . I try to make my class interesting to the students. I try to get them involved with things that they are reading about. For example, today they are working on graphs. Some students do very well in graphing exercises. Notice that these students seem to understand what goes into this graph: the lines are straight, the labels are there. . . students need this kind of information in order to understand their society better.*

Western City High School - an orientation to government

CONCLUDING STATEMENT

This report concludes the study on the status of mathematics, science, and the social sciences in Western City. The approach taken in this study was primarily observational coupled with data collected from documents made available from various sources. Numerous interviews were held with many parents, students, and administrators. What has emerged from the conversations, interviews, and readings is what is found in this report.

The most significant findings of this study, I would conclude, are the following:

1. The science program for ethnic minority children in Western City is not meaningful enough or relevant to their needs (since most of them do not go to college and a large number of them are not successful in the general science classes) and is producing a science illiterate segment of the population.

2. There has been a decline in teacher commitment to working with students and instructing them in mathematics, science, and the social sciences. Teaching is becoming more "traditional" in approach as evidenced by lack of acceptance of the newer curricula in these areas and the extended use of the text, dittos, and drill-type exercises.

3. Teachers are becoming more dissatisfied with teaching. The benefits derived from teaching are not commensurate with the position; personal satisfaction is becoming less and less a criterion for wanting to remain a teacher and is evidenced by the number of teachers leaving the field and others voicing disgust with the school system.

4. As teachers and students become more militant in their organizing activities, the administration appears to be losing control of the schools. A condition of restlessness seems to be developing with respect to administrative control of the schools. This situation is readily observed by shortened length of time teachers spend in classes, an increase in the number of student absences, and the number of student referrals to the counselors at the school.

AFTERWORD

As explained in Booklet 0, the section on methodology, observers for this CSSE Project were selected to represent different viewpoints, and local respondents and representatives were given opportunities to present disclaimers. For example, in Chapter 12 a site visitor comments in very favorable terms about science education in Western City High School.

In the attachment, one of Western City's district-level administrators presents his version of certain issues described by the observer. Perceptions and judgments, of course, are the keys to understanding this disagreement. The methodology section of Booklet 0 reflects our attempts to anticipate and acknowledge discrepancies such as those spotlighted in this exchange of views.

WESTERN CITY SCHOOL DISTRICT

October 10, 1977

Dr. Robert Stake
University of Illinois
C.I.R.C.E.
College of Education
270 Education Bldg.
Urbana, Illinois 61801

Dear Dr. Stake:

Thank you for the opportunity to add to the report of your local representative, Dr. Serrano.

I met with him after reading his initial report, and provided him some notes to clear up certain areas in his report. Most of these he did not include, so I will cover these here.

As you're undoubtedly aware, the trend all across our country is to encourage individual schools to "do their own thing." This can be seen in all of the ESEA guidelines. With direction like that, it makes it all the more difficult to maintain certain continuity in larger school districts. Individual teachers will comment on things frequently without full knowledge on the area in which they are speaking and leave impressions that may not be representative.

It was never explained satisfactorily to me exactly what the ethnic makeup of schools says about what is being taught in our country in Science, Math and Social Studies. Is the study based on what is being taught in schools of certain ethnic composition? I saw nothing in original outlines to indicate that this was the case. For whatever reasons, the study ended up utilizing largely K-6 schools receiving "Special Funds" (such as ESEA Title I) which could tend to skew the results to some degree.

Continued reference is made to ethnic makeup in negative terms and tenuously tied to instruction and materials. No real evaluation . . . nor was this listed as an area for study.

The state laws of California mandate that each elementary school district shall adopt a district-wide Course of Study, and that teachers are required to follow that Course of Study. Our Course of Study is updated each time we have a new state textbook adoption, and our Course of Study covers all of the areas your team was reviewing.

Our district still maintains a somewhat centralized curriculum approach and works with teachers to develop Curriculum Guides for each grade level and subject area. Both a Course of Study and a Curriculum Guide are placed in each teacher's hands. The Curriculum Guide refers to the Course of Study on what to teach, then it provides suggestions on ways of teaching, and lists materials which can be used. These include books, maps, charts, films, filmstrips, cassette tapes, etc. All of these are either at the school site or are available within two days delivered to the school. Almost all materials have been selected by teacher committees, and salary units are afforded those who choose to work on the committees.

Regular meetings are called by the Junior High Consultants to meet with the Junior High Department Leaders. These people are paid an additional stipend to provide leadership in their respective subject areas and are responsible for assisting with curriculum in each of their schools.

In Science, for grades 7-8, our Curriculum is not written to include delving into many of the laboratory type approaches, particularly chemistry and biology. We try to lay a basic science foundation and leave the laboratory skills to the High Schools.

On page 7-5, you refer to 'time limits'. These are non existent, except for a physical education requirement of 100 minutes per week. The state does mandate approximately 20 areas of instruction which must be taught each year, but there are no suggested amounts of time. Also, there are no required time allocations to receive any special funding. However, teachers do feel the pressures of all of the outside influences, including test scores in reading and math and consequently, many of them unintentionally direct a lot of attention to areas tested and excuse this with the statement about 'time'.

Many of the statements, such as on page 7-5, show the constraints felt by many of us, and for which we find no help in resolving.

On page 7-6, you refer to participation in the NSF Science Program. At the time we started these programs, we sent teachers from each school and the principal to a two week inservice. Schools chose the particular science program they desired and this was purchased for the school; SAPA for most . . . USMES for a few. Six Junior Highs were supplied with Silver Burdette laboratories. All schools are supplied with Science materials. These titles were selected by the District Teacher Committee. Then the individual schools selected the one which they desired.

It undoubtedly is true, in terms of priorities, that there is sometimes a tendency to pay more attention to some areas of the curriculum than others. When trying to implement all that is to be taught in a 230 minute day (1st grade), to 300 minute day (6th grade), and a little longer in grades 7-8, there are these constraints.

On several pages testing is mentioned, but it is important to note:

- district requirement is for testing once each year...in the spring
- schools with some sort of "Special Funding" also require a test each fall for "pre-testing"
- I know of no other requirement

For page 7-7, refer also to my notes above.

On page 7-8, it is stated, the Course of Study "is not sent to the district at large." The opposite is true. And regarding what is taught, our total district parent population was assessed as to their priorities on what is to be taught and the results of that needs assessment is used.

On page 7-14, the word "tracked" is used. By definition, tracking is where children proceed through most of the day together, and the negative connotation occurs when this all day placement is determined on the basis of ability. Grouping, and regrouping, based on skill level to be taught is not "tracking."

The "offering" of Science, or any other area, is not at the discretion of the principal. Again, we must refer to the Course of Study. On materials, the 7th grade guide has a 10-page listing of materials, and each Junior High has up to 8 World Maps.

Some of the comments I supplied for the report were used. I don't know why other comments I supplied were not adequate for the report, but I must state, we do have a good instructional program and are proud of it. We also recognize we have room for improvement. But this report supplies few of the positives and delves on social factors. Many of these seem unrelated to the task assigned in this study.

I hope some of these comments add to the total picture of the Western City School District.

Sincerely,

(signed)

Director of Instruction

Rodolfo G. Serrano is Associate Professor of Education in the School of Education, California State College, Bakersfield. His contribution to the CSSE project reflects his special interests as an anthropologist.

Rudy received his Ph.D. from the University of Arizona (1972), after spending twelve years as a physics teacher and several more years as Assistant Professor of Education at, successively, the University of New Mexico and California State College. He has been involved in numerous research activities, and has directed such studies as "A Study of a Junior High School in a Predominantly Chicano Neighborhood" and "Desegregation in the Southern San Joaquin Valley" (both NIE grants); and "Bilingual/Bicultural Fellowship Program" and "Developing Skills for Emerging Educational Responsibilities" (both HEW grants). He is a fellow of the American Association for Advancement of Science and of the American Anthropological Association, and is a charter member of the American Anthropological Association Society for Visual Anthropology.

His publications include two books, Los Bareleenos de Albuquerque, Nuevo Mexico and Dictionary of Pachuco Terms,

and several films. One of these, "El Gato y El Raton" ("Migrant Children at Play"), was accepted by the Smithsonian Institution for its archives. Rudy has also presented papers at a variety of educational conferences and has served as a consultant to local, state, and federal groups involved in education.

He lives in Bakersfield with his wife, Greta, and their three children.